Recent pipeline explosions highlight the need for tougher regulation of gas leaks

Romany Webb June 12, 2015

On Tuesday, the National Transportation Safety Board announced the findings of its investigation into last year's deadly gas pipeline explosion in East Harlem, New York. Investigators found that the explosion, which killed 8 people and injured 50 others, was caused by gas leaking from a defective weld on the pipeline. Defective welding was also blamed for a pipeline explosion in San Bruno, California in 2010. The pipeline in question had been installed in the 1950s and, as was common at that time, comprised a number of small sections that had been welded together. Defects in the welding caused the pipeline to break, releasing gas and triggering a fire that killed 8 people and destroyed 35 houses.

Unfortunately, these are not isolated incidents. According to the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), between 1995 and 2014, there were 818 gas pipeline accidents resulting in death or personal injury. A further 2086 accidents resulted in significant property damage of $50,000 or more. That's equivalent to roughly 145 accidents each year, or nearly 3 per week.

Nevertheless, the risk of a pipeline accident is fairly small, relative to the volume of gas transported. Each year, several trillion cubic feet of gas is transported via approximately 2.5 million miles of pipeline. Large, high capacity pipelines (known as transmission pipelines) are used to move gas from field production and processing areas to local utilities, which then use smaller lines (known as distribution pipelines) to deliver the gas to consumers. Most of the time, the gas is delivered without incident. Occasionally however, gas may leak from the pipeline, endangering public safety.

Gas leaks are most likely to occur from older pipelines. PHMSA data indicate that approximately one-third of gas distribution mains currently in use were installed prior to 1970. The figure is even higher for transmission lines, with over half of those currently used installed prior to 1970. Many of these pipelines were manufactured using cast or wrought iron which is prone to graphitization. Similarly, many old cooper and bare steel pipelines are frequently affected by corrosion. This may lead to cracks in the pipeline, resulting in gas leakage. If the leak is not detected and repaired quickly, gas may build-up over time, increasing the risk of a pipeline explosion. Even if this does not occur, the leaking gas may threaten public health and the environment. (As previously reported, natural gas is comprised principally of methane, a short-lived but potent greenhouse gas. Consequently, gas leaks from pipelines and/or other facilities can accelerate climate change.)

Seeking to reduce gas leakage, in March 2012, the PHMSA issued an advisory bulletin urging pipeline operators to accelerate the replacement of aging pipelines. Supporting these efforts, the Federal Energy Regulatory Commission recently adopted new rules making it easier for operators of interstate pipelines to recover capital expenditures made to upgrade pipeline infrastructure. Similar rules, applying to intrastate pipelines, have been adopted in 27 states and the District of Columbia.

Even with these policies, replacement of aging pipeline systems is expected to take several years. Additional measures must, therefore, be taken to ensure pipeline safety. In particular, there is a need for tougher regulation of pipeline operations so as to minimize the risk of gas leaks.

Primary regulatory authority over the pipeline system rests with the PHMSA. PHMSA regulations (49 CFR Part 192) require pipeline operators to periodically inspect the system for leaks. If a leak is detected, the operator must determine what remedial action to take based on its assessment of the extent of potential hazard resulting from the leak. Operators must, under the federal regulations, ensure prompt repair of leaks posing a hazard to persons or property. The regulations do not, however, require repair of non-hazardous leaks. Consequently, those leaks can be, and often are, left unrepaired for months or even years.

Building on the federal regulations, fifteen states have adopted their own rules governing leak repair. These state-based rules specify timeframes, ranging from 1 to 15 months, for leaks that do not currently pose a hazard to persons or property but may become hazardous in the future. The rules in 4 states also specify timeframes, ranging from 2 to 5 years, for the repair of leaks that are and will likely remain non-hazardous. (An additional 2 states have timeframes for some, but not all, non-hazardous leaks).

Notwithstanding the above, in the vast majority of states, there are no mandatory timeframes for leak repair. This gives rise to a number of problems. Perhaps most significantly, pipeline operators can often delay or even avoid repair of hazardous leaks. An operator may, for example, vent leaking gas to reduce pressure and minimize the risk of an explosion. Based on that action, the operator may conclude that the leak is non-hazardous and, as such, does not require repair. However, until repair work is completed, gas will continue to leak from the pipeline. The rate of gas leakage may increase over time, heightening the risk of a major pipeline rupture. Even if a rupture does not occur, increasing gas leakage poses serious risks to public health and the environment, as discussed above.

These problems could be addressed by amending the regulations to require timely repair of all pipeline leaks. Until such a requirement is adopted, pipeline operators will likely continue to leave many leaks unrepaired, with potentially devastating consequences.

climate change methane National Transportation Safety Board natural gas pipeline Pipeline and Hazardous Materials Safety Administration

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